

CURRICULUM VITAE

Name: Michael Jay Sadowsky

Present Title: Distinguished McKnight University Professor

Department of Soil, Water, and Climate, and BioTechnology Institute,
Co-Director Microbial and Plant Genomics Institute; and Director of
Graduate Studies Microbial Ecology Graduate Program

Address: Department of Soil, Water, and Climate
University of Minnesota
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Education:

Ph.D., 1983. University of Hawaii, Honolulu, Hawaii. Major: Microbiology

M.S., 1979. University of Wisconsin-Oshkosh, Wisconsin. Major: Microbiology

B.S., 1977. University of Wisconsin-Madison, Wisconsin. Major: Bacteriology

Professional Experience:

Distinguished McKnight University Professor: Department of Soil, Water, & Climate, and
BioTechnology Institute, University of Minnesota, St. Paul, Minnesota, 04/04 - present.

Professor: Department of Soil, Water, and Climate and Department of Microbiology
University of Minnesota, St. Paul, Minnesota, 07/96 – 04/04.

Associate Professor: Departments of Soil Science and Microbiology
University of Minnesota, St. Paul, Minnesota, 07/93 - 6/96.

Assistant Professor: Departments of Soil Science and Microbiology
University of Minnesota, St. Paul, Minnesota, 06/89 - 6/93.

Microbiologist: U.S. Department of Agriculture-ARS; Beltsville, Maryland, 01/86 - 05/89.

Research Molecular Biologist: Allied Corporation; Syracuse, New York, 04/85 - 12/85.



Current Research Studies:

Use of DNA technologies to determine sources of fecal pollutants in the environment.

Biochemistry, genetics, and genomics of microorganisms degrading atrazine and other chlorinated compounds.

Molecular basis for salt and desiccation tolerance in *Bradyrhizobium japonicum*.

Awards and Honors:

2009	CFANS Distinguished Graduate Teaching Award
2008	CFANS Distinguished Diversity and Inclusion Award
2008	Fellow, American Association for the Advancement of Science
2004	Distinguished McKnight Professorship
1999	Fellow, American Academy of Microbiology
1990	Young Investigator Award, American Society for Microbiology.
1988	Patent Award, U.S. Department of Agriculture.
1991-1992	Bush Foundation Excellence in Teaching Program.

Professional Activities:

Speaker – American Society for Microbiology Branch Lectureship Program 2008-2010
 Co-Editor: American Society for Microbiology Book – Microbial Source Tracking. ASM Press, Washington DC Released in 2007.
 American Society for Microbiology - Region V Representative, 2004-present
 Editor, Applied and Environmental Microbiology 1999-2003
 Associate Editor, Symbiosis 1997 - present
 Associate Editor - Microbe and Environments 2000 – present
 Co-Organizer of Genomics of a-Proteobacterium Symposium 2005. Blacksburg, VA
 Organizer of: Tracking Sources and Sinks of Microorganisms in the Environment Session – 102nd General Meeting American Society for Microbiology. 2001. Salt Lake City, UT
 Organizer: U.S.-Japan NSF-JSPS Symposium “Symbioses Between Plants and Microbe for Sustainable Agriculture and Bioremediation”, 2001, St. Paul, MN..
 Organizer: *Bradyrhizobium japonicum* Genome Annotation Workshop, October 25-29, 2001, Minneapolis, MN

Patents Held:

(1) A Mu-dl(Kan, lac) vector system for analysis of symbiotic genes in *Rhizobium*; Patent awarded in Canada and U.S. through Allelix Inc.; (2) U.S. patent 6,265,201: "Improved enzyme for atrazine biodegradation"; (3) U.S. patent 6,284,522: "Isolated and purified DNA molecule and protein for the degradation of triazine compounds"; (4) US 193,394, "SAFTI-Pak, Solid Appliance Fermentation Technology for Inoculants"; submitted by University of Hawaii. (5)

U.S. patent 6,369,299 "Atrazine-degrading plants"; Submitted by University of Minnesota and Novartis Crop Protection

Refereed Publications: 1983-2008 (out of 140 publications)

1. **Sadowsky, M. J., W. Koskinen, M. Bischoff, B. Barber, J. Becker, and R. Turco.** 2009. Rapid and complete degradation of the herbicide picloram by *Lipomyces kononenkoae*. *J. Ag. Food Chem.* DOI 10.1021/jf900067f
2. **Hansen, D., S. Ishii, M. J. Sadowsky and R. E. Hicks.** 2009. *Escherichia coli* populations in great lakes waterfowl exhibit spatial stability and temporal shifting. *Appl Environ Microbiol.* 75: 1546–1551.
3. **Ishii, S., and M. J. Sadowsky.** 2009. Applications of the rep-PCR DNA Fingerprinting Technique to Study Microbial Diversity, Ecology, and Evolution. *Environ. Microbiol.* 11: 733 – 740.
4. **Ghosh, S., J. Gralnick, M. Roberts, M. Sadowsky, and T. LaPara,** 2009. *Sphingobacterium* sp. strain PM2-P1-29 harbours a functional tet(X) gene encoding for the degradation of tetracycline. *J. Appl. Microbiol.* 106:1336–1342.
5. **Shamseldin, A., M. El-Saadania, M. J. Sadowsky, and Chung Sun An.** 2009. Rapid Identification and discrimination among Egyptian genotypes of *Rhizobium leguminosarum* bv. *viciae* and *Sinorhizobium meliloti* nodulating faba bean (*Vicia faba* L.) by analysis of nodC, ARDRA, and rDNA sequence analysis. *Soil Biol. Biochem.* 41: 45–53.
6. **Cytryn, E. J., S. Jitacksorn, E. Giraud, and M. J. Sadowsky.** 2008. Insights learned from pBTAi1, a 229 Kb accessory plasmid from *Bradyrhizobium* sp. strain BTAi1 and prevalence of accessory plasmids in other *Bradyrhizobium* sp. strains. *ISME J.* 2: 158–170.
7. **Shamseldin, A., M. J. Sadowsky, M. El-Saadani, and C. S. An.** 2008. Molecular biodiversity and identification of free living *Rhizobium* strains from diverse Egyptian soils as assessed by direct isolation without trap hosts. *American-Eurasian J. Agric. & Environ. Sci.* 4: 541-549.
8. **Franck, W. L., Chang, W. S., Qiu, J., Sugawara, M., Sadowsky, M. J., Smith, S. A., and Stacey, G.** 2008. Whole-Genome transcriptional profiling of *Bradyrhizobium japonicum* during chemoautotrophic growth. *J. Bacteriol.* doi:10.1128/JB.00543-08.

9. **Cabrera, A., L. Cox, W. Koskinen, and M.J. Sadowsky.** 2008. Availability of triazine herbicides in aged soils amended with olive mill waste. *J. Ag. Food Chem.* 56:4112–4119.
10. **Heepnogoen, Pimpak, Kannika Sajjaphan, John A. Ferguson, and Michael J. Sadowsky.** 2008. Genetic and Physiological Characterization of oxytetracycline-resistant bacteria from giant prawn farms. *J. Microbiol. Biotechnol.* 18:199–206.
11. **Ishii, S., and M. J. Sadowsky.** 2008. *Escherichia coli* in the Environment: Implications for Water Quality and Human Health. *Microbes and Environments.* 23:101-108.
12. **Accinelli, C. W. Koskinen, J. Becker, and M. J. Sadowsky.** 2008. Mineralization of the *Bacillus thuringiensis* Cry1Ac endotoxin in soil. *J. Agric. Food Chem.* 56:1025–1028.
13. **Jitacksorn, S., and M. J. Sadowsky.** 2008. Nodulation gene regulation and quorum sensing control density-dependent suppression and restriction of nodulation in the *Bradyrhizobium japonicum*-soybean symbiosis. *Appl Environ Microbiol.* 74:3749-3756.
14. **Byappanahalli, M. N., R. Sawdey, S. Ishii, D. A. Shively, J. A. Ferguson, R. L. Whitman, and M. J. Sadowsky.** 2008. Seasonal stability of *Cladophora*-associated *Salmonella* in Lake Michigan watersheds. *Water Res.* 43: 806-814.
15. **Hansen, D. L., J. J. Clark, S. Ishii, M. J. Sadowsky, and R.E. Hicks.** 2008. Sources and sinks of *Escherichia coli* in benthic and pelagic fish. *J. Great Lakes Res.* 34:228-234.
16. **Cytryn, E..J., D. P. Sangurdekar, J. G. Streeter, W. L. Franck, W. S. Chang, G. Stacey, D. W. Emerich, T. Joshi, D. Xu, and M. J. Sadowsky.** 2007. Transcriptional and physiological responses of *Bradyrhizobium japonicum* to desiccation-induced stress. *J. Bacteriol.* 189:6751-6762.
17. **Giraud E, Moulin L, Vallenet D, Barbe V, Cytryn E, Avarre JC, Jaubert M, Simon D, Cartieaux F, Prin Y, Bena G, Hannibal L, Fardoux J, Kojadinovic M, Vuillet L, Lajus A, Cruveiller S, Rouy Z, Mangenot S, Segurens B, Dossat C, Franck WL, Chang WS, Saunders E, Bruce D, Richardson P, Normand P, Dreyfus B, Pignol D, Stacey G, Emerich D, Vermeglio A, Medigue C, and M. J. Sadowsky.** 2007. Legumes symbioses: absence of Nod genes in photosynthetic bradyrhizobia. *Science* 316:1307-1312.
18. **Lee, J. H., M.G. Kim, B. Yoo, N. V. Myung, M. J. Sadowsky, J. K. Fredrickson, and H. G. Hur.** 2007. Biogenic formation of photoactive arsenic-sulfide nanotubes by *Shewanella* sp. strain HN-41. *Proceedings of the National Academy of Sciences (USA)* 104: 20410-20415.
19. **Chang, W.-S., W. L. Franck, E. Cytryn, S. Jeong, T. Joshi, D. W. Emerich, M. J. Sadowsky, D. Xu, and G. Gary Stacey.** 2007. An oligonucleotide microarray resource

for transcriptional profiling of *Bradyrhizobium japonicum*. Molec. Plant Microbe Interact. **20**:1298–1307.

20. **Shapir, N., E. F. Mongodin, M. J. Sadowsky, S. C. Daugherty, K. E. Nelson, and L. P. Wackett.** 2007. Evolution of catabolic pathways: genomic insights into microbial s-triazine metabolism. J. Bacteriol. **189**:674-682.
21. **Yan, T., M. Hamilton, and M. J. Sadowsky.** 2007. High throughput and quantitative procedure for determining sources of *Escherichia coli* in waterways using host-specific DNA marker genes. Appl. Environ. Microbiol. **73**:890–896.
22. **Ishii, S., K. P. Meyer, and M. J. Sadowsky.** 2007. Relationship between Phylogenetic Groups, Genotypic Clusters, and Virulence Gene Profiles of *Escherichia coli* Strains Isolated from Diverse Human and Animal Sources. Appl. Environ. Microbiol. **73**: 5703-5710.
23. **MacLean, A. M, T. M. Finan, and M. J. Sadowsky.** 2007. Genomes of the symbiotic nitrogen-fixing bacteria of legumes. Plant Physiol. **144**:615-622.
24. **Ksoll, W. B., S. Ishii S, M. J. Sadowsky, and R. E. Hicks.** 2007. Presence and sources of fecal coliform bacteria in epilithic periphyton communities of Lake Superior. Appl. Environ. Microbiol. **73**:3771-3778.
25. **Seffernick, J. L., A. Aleem, J. P. Osborne, G. Johnson, M. J. Sadowsky, and L. P. Wackett.** 2007. Hydroxyatrazine N-ethylaminohydrolase (AtzB): An amidohydrolase superfamily enzyme catalyzing deamination and dechlorination. J. Bacteriol. **189**: 6989-6997.
26. **Byappanahalli, M. N., R. L. Whitman, D. A. Shively, J. Ferguson, S. Ishii, and M. J. Sadowsky.** 2007. Population structure of *Cladophora*-borne *Escherichia coli* in nearshore water of Lake Michigan. Water Res. **41**:3649-3654.
27. **Ishii, S., D. L. Hansen, R. E. Hicks, and M. J. Sadowsky.** 2007. Beach sand and sediments are temporal sinks and sources of *Escherichia coli* in Lake Superior. Environ. Sci. Technol. **41**:2203-2209.
28. **Accinelli, C., W. C. Koskinen, J. M. Becker, and M. J. Sadowsky.** 2007. Environmental fate of two sulfonamide antimicrobials agents in soil. J. Agric. Food Chem. **55**:2677-2682.
29. **Ma, X., P. J. Novak, J. Ferguson; M. Sadowsky, T. M. LaPara, M. J. Semmens , and R. M. Hozalski.** 2007. The impact of H₂ addition on dechlorinating microbial communities. Bioremed. J. **11**:45-55.

30. **Yan, T., and M. J. Sadowsky.** 2007. Determining sources of fecal bacteria in waterways. *Environ. Monitor. Assess.* **129**:97-106
31. **Mongodin, E. F., N. Shapir, S. C. Daugherty, R. T. DeBoy, J. Emerson, A. Shvartzbeyn, D. Radune, J. Vamathevan, F. Riggs, V. Grinberg, H. Khouri, L. P. Wackett, K. E. Nelson1, and M. J. Sadowsky.** 2006. Secrets of soil survival revealed by the genome sequence of *Arthrobacter aurescens* TC1. *PLoS Genet.* **2**(12): e214 doi:10.1371/journal.pgen.0020214
32. **Ishii, S., W. B. Ksoll, R. E. Hicks, and M. J. Sadowsky.** 2006. Presence and growth of naturalized *Escherichia coli* in temperate soils from Lake Superior watersheds. *Appl. Environ. Microbiol.* **72**:612-621.
33. **Byappanahalli, M. N., R. L. Whitman, D. A. Shively, M. J. Sadowsky, and S. Ishii.** 2006. Population structure, persistence, and seasonality of autochthonous *Escherichia coli* in temperate, coastal forest soil from a Great Lakes watershed. *Environ. Microbiol.* **8**:504-513.
34. **Shapir, N., G. Cheng, M. J. Sadowsky, and L. P. Wackett.** 2006. Purification and characterization of TrzF: Biuret hydrolysis by allophanate hydrolase supports growth. *Appl. Environ. Microbiol.* **72**:2491-2495.
35. **Ishii, S., T. Yan, D. A. Shively, M. N. Byappanahalli, R. L. Whitman, and M. J. Sadowsky.** 2006. *Cladophora* (Chlorophyta) harbors human bacterial pathogens in nearshore water of Lake Michigan. *Appl. Environ. Microbiol.* **72**:4545-4553.
36. **Hamilton, M. J., T. Yan, and M. J. Sadowsky.** 2006. Development of goose- and duck-specific DNA markers to determine sources of *Escherichia coli* in waterways. *Appl. Environ. Microbiol.* **72**:4012-4019.
37. **Merlo, L. M. F., M. J. Sadowsky, J. A. Ferguson, and A. M. Dean.** 2006. The *argRB* of *Escherichia coli* is rare in isolates obtained from natural sources. *Gene.* **276**:240-247.
38. **Shapir, N., C. Pedersen, O. Gil, L. Strong, J. Seffernick, M. J. Sadowsky, and L. P. Wackett.** 2006. TrzN from *Arthrobacter aurescens* TC1 is a zinc amidohydrolase. *J. Bacteriol.* **188**:5859-5864.
39. **Sadowsky, M. J., W. C. Koskinen, J. Seebinger, B. L. Barber, and E. Kandeler.** 2006. Automated robotic assay of phosphomonoesterase activity in soils. *SSSAJ* **70**:378-381.
40. **Regitano, J. B., W. C. Koskinen, and M. J. Sadowsky.** 2006. Influence of soil aging on sorption and bioavailability of simazine. *J. Ag. Food Chem.* **54**:1373-1379.

41. **Accinelli, C., W. C. Koskinen, and M. J. Sadowsky.** 2006. Influence of Cry1Ac Toxin on Mineralization and Bioavailability of Glyphosate in Soil. *J. Agric. Food Chem.* **54**:164-169.
42. **Wang, L., D. A. Samac, N. Shapir, L. P. Wackett, C. P. Vance, N. E. Olszewski, and M. J. Sadowsky.** 2005. Biodegradation of atrazine in transgenic plants expressing a modified bacterial atrazine chlorohydrolase (*atzA*) gene. *Plant Biotech.* **3**:475-486.
43. **Byappannahalli, M. N., R. L. Whitman, D. A. Shively, M. J. Sadowsky, S. Ishii.** 2005. Persistence, spatial-temporal, and genetic characterization of *Escherichia coli* in temperate forest soils of a Great Lakes coastal watershed. *Environ. Microbiol.* **8**:504-513.
44. **Spokas, K., D. Wang, R. Venterea, and M. J. Sadowsky.** 2005. Mechanisms of N₂O production following chloropicrin fumigation. *Appl. Soil Ecol.* **31**:101–109.
45. **Cheng, G., N. Shapir, M. J. Sadowsky, and L. P. Wackett.** 2005. Allophanate hydrolase, not urease, functions in bacterial cyanuric acid metabolism. *Appl. Environ. Microbiol.* **71**:4437-4445.
46. **Shapir, N., M. J. Sadowsky, and L. P. Wackett.** 2005. Purification and characterization of allophanate hydrolase (AtzF) from *Pseudomonas* sp. strain ADP. *J. Bacteriol.* **187**:3731-3738.
47. **Accinelli, C., W. Koskinen, J. D. Seebinger, A. Vicari, and M. J. Sadowsky.** 2005. Effects of incorporated corn residues on glyphosate mineralization and sorption in soil. *J. Agric. Food Chem.* **53**:4110-4117.
48. **Pongsilp, N., Triplett, E.W., and M. J. Sadowsky.** 2005. Detection of homoserine lactone-like quorum sensing molecules in *Bradyrhizobium* strains. *Curr. Microbiol.* **51**:250-254.
49. **Shapir, N., C. Rosendahl, G. Johnson, M. Andreina, M. J. Sadowsky, and L. P. Wackett.** 2005. Substrate specificity and colorimetric assay for recombinant TrzN derived from *Arthrobacter aurescens* TC1. *Appl. Environ. Microbiol.* **71**:2214-2220.
50. **Emerson, J.P., M. L. Wagner, M. F. Reynolds, L. Que, M. J. Sadowsky, and L. P. Wackett.** 2005. The role of histidine 200 in MnD, the Mn(II)-dependent 3,4-dihydroxyphenylacetate 2,3-dioxygenase from *Arthrobacter globiformis* CM-2, a site-directed mutagenesis study. *J. Biol. Inorg. Chem.* **10**:751-760.
51. **Bryan, A., and M. J. Sadowsky.** 2004. Frequency and distribution of tetracycline resistance genes in genetically-diverse, non-selected, and natural *Escherichia coli* isolated from diverse human and animal sources. *Appl. Environ. Microbiol.* **70**:2503-2507.

52. **Sajjaphan K., L. P. Wackett, M. Palmer, B. Blackmon, J. Tomkins, and M. J. Sadowsky.** 2004. Sequence and analysis of a 161 kb atrazine catabolic gene region in *Arthrobacter aurescens* strain TC1 reveals its plasmid origin. *Appl. Environ. Microbiol.* **70**:4402-4407.
53. **Alamgir Rahman, F., D. L. Allan, C. J. Rosen, and M. J. Sadowsky.** 2004. Arsenic availability from chromated copper arsenate (CCA) treated wood. *J. Environ. Qual.* **33**:173-80.
54. **Johnson, L.K., M. B. Brown, E. A. Carruthers, J. A. Ferguson, P.E. Dombek and M. J. Sadowsky.** 2004. Sample size, library composition, and genotypic diversity influence accuracy of determining sources of fecal pollution among natural populations of *Escherichia coli* from different animals. *Appl. Environ. Microbiol.* **70**: 4478-4485.
55. **Byappanahalli, M., D. Shively, M. B. Nevers, M. J. Sadowsky, and R. L. Whitman.** 2003. Growth and survival of *Escherichia coli* and enterococci populations in the macro-alga *Cladophora* (Chlorophyta). *FEMS Microbiol. Ecol.* **46**:203-211.
56. **Sameshima, R., T. Isawa, M. J. Sadowsky, T. Hamada, H. Kasai, A. Shuttsirung, H. Mitsui, and K. Minamisawa.** 2003. Phylogeny and distribution of extra-slow-growing *Bradyrhizobium japonicum* harboring high copy numbers of RS alpha, RS beta and IS1631. *FEMS Microbiol. Ecol.* **44**:191-202.
57. **Myoda, S. P., C. Andrew Carson, J. J. Fuhrmann, B.-K. Hahm, P. G. Hartel, H. Yampara-Iquise, L. Johnson, R. L. Kuntz, C. Nakatsu, M. J. Sadowsky, and M. Samadpour.** 2003. Comparison of genotypic-based microbial source tracking methods requiring a host origin database. *J. Water Health* **1**:167-180.
58. **Ritter, K. J., E. Carruthers, C. A. Carson, R. D. Ellender, V. J. Harwood, K. Kingsley, C. Nakatsu, M. Sadowsky, B. Shear, B. West, J. E. Whitlock, B. A. Wiggins, and J. D. Wilbur.** 2003. Assessment of statistical methods used in library-based approaches to microbial source tracking. *J. Water Health* **1**:209-223.
59. **Fruchey, I., Shapir, N., Sadowsky, M.J., and L. P. Wackett.** 2003. On the origins of cyanuric acid hydrolase: purification, substrates, and prevalence of AtzD from *Pseudomonas* sp. strain ADP. *Appl. Environ. Microbiol.* **69**:3653-3657.
60. **Shapir, N., Osborne, J. P., Johnson, G., Sadowsky, M. J., and L. P. Wackett.** 2002. Purification, substrate range, and metal center of AtzC: the N-isopropylammelide aminohydrolase involved in bacterial atrazine metabolism. *J. Bacteriol.* **184**:5376-5384.
61. **Strong, L. C., C. Rosendahl, G. Johnson, M. J. Sadowsky, and L. P. Wackett.** 2002. *Arthrobacter aurescens* TC1 metabolizes diverse s-triazine ring compounds. *Appl. Environ. Microbiol.* **68**:5973-5980.

62. **Sajjaphan, K., N. Shapir, A. K. Judd, L. P. Wackett, and M. J. Sadowsky.** 2002. A novel *psba1* gene from a naturally-occurring atrazine-resistant cyanobacterial isolate. *Appl. Environ. Microbiol.* **168**:1358-1366.
63. **Montealegre, C. M., C. van Kessel, M. P. Russelle, and M. J. Sadowsky.** 2002. Changes in Microbial Activity and Composition in a Pasture Ecosystem Exposed to Elevated Atmospheric Carbon Dioxide. *Plant and Soil.* **243**: 197-207
64. **Wackett, L.P., M.J. Sadowsky, B. Martinez, N. Shapir.** 2002. Biodegradation of atrazine and related triazine compounds: From enzymes to field studies. *Appl. Microbiol. Biotechnol.* **58**:39-45.
65. **Seffernick J. L., Shapir, N., Schoeb, M., Johnson, G., Sadowsky, M. J., and Wackett L.P.** 2002. Enzymatic degradation of chlorodiamino-s-triazine. *Appl Environ Microbiol.* **68**:4672-4675.
66. **Pongsilp, N., N. Teaumroong, A. Nuntagij, N. Boonkerd, and M. J. Sadowsky.** 2002. Genetic structure of indigenous non-nodulating and nodulating populations of *Bradyrhizobium* in soils from Thailand. *Symbiosis.* **33**:39-58.
67. **Shapir, N., J. P. Osborne, G. Johnson, M. J. Sadowsky, and L. P. Wackett.** 2002. Purification, substrate range, and metal center of AtzC: the *N*-isopropylammelide amidohydrolase involved in bacterial atrazine metabolism. *J. Bacteriol.* **184**:5376-5384.
68. **Jennifer L. Seffernick, Hugh McTavish, Jeffrey P. Osborne, Mervyn L. de Souza, Michael J. Sadowsky, and Lawrence P. Wackett.** 2002. Atrazine chlorohydrolase from *Pseudomonas* sp. strain ADP is a metalloenzyme. *Biochem.* **41**:14430-14437.
69. **Strong, L., C. Pedersen, G. Johnson, M. J. Sadowsky, and L. P. Wackett.** 2002. *Arthrobacter aurescens* TC1 Metabolizes Diverse *s*-Triazine Ring Compounds. *Appl. Environ. Microbiol.* **68**:5973-5980.
70. **Martinez, B., J. Tomkins, L. P. Wackett, R.Wing, and M. J. Sadowsky.** 2001. Complete nucleotide sequence and organization of the atrazine catabolic plasmid pADP-1 from *Pseudomonas* sp. strain ADP. *J. Bacteriol.* **183**:5684-5697.
71. **Tomkins, J. P., T. C. Wood, M.G. Stacey, J. T. Loh, A. Judd, J. L. Goicoechea, G. Stacey, M. J. Sadowsky, and R. A. Wing.** 2001. A marker-dense physical map of the *Bradyrhizobium japonicum* genome. *Genome Research.* **11**:1434-1440.
72. **Seffernick, J. L., M. de Souza, M. J. Sadowsky, and L. P. Wackett.** 2001. Melamine deaminase and atrazine chlorohydrolase: 98% identical but functionally different. *J. Bacteriol.* **183**: 2405-2410.

73. **Johnson, P., N. T. Keen, J. K. Lunney, and M. J. Sadowsky.** 2001. Agricultural Microbe Genome 2: Conference Editorial. Comparative and Functional Genomics **18**:1-4.
74. **Lohrke, S.M., Madrzak, C.J., Hur, H.-G., Judd, A. K., Orf, J. H., and M. J. Sadowsky.** 2000. Innoculum density-dependent restriction of nodulation in the soybean-*Bradyrhizobium japonicum* symbiosis. Symbiosis **29**:59-70.
75. **Montealegre, C. M., van Kessel, C., Blumenthal, Jurg, Hur, Hor-Gil, Hartwig, U. A., and M.J. Sadowsky.** 2000. Elevated atmospheric CO₂ alters microbial population structure in a pasture ecosystem. Global Change Biology. **6**:475-482.
76. **Seffernick, J. L., G. Johnson, M. J. Sadowsky, and L. P. Wackett.** 2000. Substrate Specificity of Atrazine Chlorohydrolase and Atrazine-Catabolizing Bacteria. Appl. Environ. Microbiol. **66**:4247-4252.
77. **Dombek, P.E., L. K. Johnson, S. T. Zimmerley, and M. J. Sadowsky.** 2000. Use of repetitive DNA sequences and the polymerase chain reaction to differentiate *Escherichia coli* from human and animal sources. Appl. Environ. Microbiol.**66**:2572-2577.
78. **Strong, L. C., McTavish, H., Sadowsky, M. J., and Wackett, L. P.** 2000. Field-scale remediation of atrazine-contaminated soil using recombinant *Escherichia coli* expressing atrazine chlorohydrolase. Environ. Microbiol. **2**:91-98.
79. **Loh, J., M. G. Stacey, M. J. Sadowsky, and G. Stacey.** 1999. The *Bradyrhizobium japonicum* nolA gene encodes three functionally distinct proteins. J. Bacteriol. **181**:1544-1554.
80. **Sadowsky, M. J., Z. Tong, M. de Souza, and L. P. Wackett.** 1998. AtzC is a new member of the amidohydrolase protein superfamily and is homologous to other atrazine-metabolizing enzymes. J. Bacteriol. **180**:152-158.
81. **de Souza, M. L., D. Newcombe, S. Alvey, D. E. Crowley, A. Hay, M. J. Sadowsky, and L. P. Wackett.** 1998. Molecular basis of a bacterial consortium: interspecies catabolism of atrazine. Appl. Environ. Microbiol. **64**:178-184
82. **de Souza, M. L., L. P. Wackett and M. J. Sadowsky.** 1998. The atzABC genes encoding atrazine catabolism genes are located on a self-transmissible plasmid in *Pseudomonas* strain ADP. Appl. Environ. Microbiol. **64**:2323-2326.
83. **Lohrke, S. L., B. Day, V. K. Kolli, R. Hancock, J. P.-Y. Yuen, M. L. de Souza, G. Stacey, R. Carlson, Z. Tong, H.-G. Hur, J. H. Orf, and M. J. Sadowsky.** 1998. The *Bradyrhizobium japonicum noeD* gene: a negatively-acting, genotype-specific nodulation gene for soybean. Molec. Plant-Microbe Interact. **11**:476-488

84. **de Souza, M. L., J. Seffernick, M. J. Sadowsky, and L. P. Wackett.** 1998. The atrazine catabolism genes atzABC are widespread and highly conserved. *J. Bacteriol.* **180**:1951-1954.
85. **Boundy-Mills, K. L., M. L. de Souza, L. P. Wackett, R. Mandelbaum, and M. J. Sadowsky.** 1997. The *atzB* gene of *Pseudomonas* sp. strain ADP encodes hydroxyatrazine ethylaminohydrolase, the second step of a novel atrazine degradation pathway. *Applied Environ. Microbiol.* **63**:916-923.
86. **Daane, L. L., J. A. E. Molina, and M. J. Sadowsky.** 1997. Plasmid transfer between spatially-separated donor and recipient bacteria in earthworm-containing soil microcosms. *Appl. Environ. Microbiol.* **63**:679-686.
87. **Daane, L. L., J. A. E. Molina, and M. J. Sadowsky.** 1997. Scanning electron microscopy of the microflora in egg capsules of the earthworm *Eisenia fetida*. *Pedobiologia* **42**:79-87.
88. **Schortemeyer, M., U. A. Hartwig, G. R. Hendrey, and M. J. Sadowsky.** 1997. Influence of free air carbon dioxide enrichment (FACE) on microbial communities in the rhizosphere of white clover and perennial ryegrass. *Soil Biology and Biochemistry*. **28**:1717-1724.
89. **Sadowsky, M. J., and M. Schortemeyer.** 1997. Soil microbial responses to increased concentrations of atmospheric CO₂. *Global Change Biology*. **3**:217-244.
90. **Pazdernik, D.L., C.P. Vance, M.J. Sadowsky, P.H. Graham, and J.H. Orf.** 1997. A host-controlled, serogroup-specific, ineffective-nodulation system in the *Bradyrhizobium*-soybean (*Glycine max*) symbiosis. *Mol. Plant Microbe Interact.* **10**:994-1001.
91. **Schortemeyer, M., H. Santruckova, and M. J. Sadowsky.** 1977. Relationship between root parameters and soil microorganisms in the rhizosphere of clover and ryegrass. *Comm. Soil Sci. Plant Anal.* **28**:1675-1682.
92. **Boldt, Y. R., A. K. Whitting, M. L. Wagner, M. J. Sadowsky, L. Que, and L. P. Wackett.** 1997. Manganese(II) active site mutants of 3,4-dihydroxyphenylacetate 2,3-dioxygenase from *Arthrobacter globiformis* strain CmM-2. *Biochemistry*. **36**:2147-2153.
93. **Hur, H.-G., L. M. Newman, L. P. Wackett, and M. J. Sadowsky.** 1997. Toluene 2-monooxygenase-dependent growth of *Burkholderia cepacia* G4/PR1 on diethyl ether. *Appl. Environ. Microbiol.* **63**:1606-1609.

94. **de Souza, M. L., M. J. Sadowsky, and L. P. Wackett.** 1996. Atrazine chlorohydrolase from *Pseudomonas* sp. ADP: gene sequence, enzyme purification and protein characterization. *J. Bacteriol.* **178**:4894-4900.
95. **Daane, L. L., J. A. E. Molina, E. C. Berry, and M. J. Sadowsky.** 1996. Influence of earthworm activity on gene transfer from *Pseudomonas fluorescens* to indigenous soil bacteria. *Appl. Environ. Microbiol.* **62**:515-521.
96. **Sadowsky, M. J., L. L. Kinkel, J. H. Bowers, and J. L. Schottel.** 1996. Use of repetitive intergenic DNA sequences and fatty Acid profiles to classify pathogenic and disease-suppressive strains of *Streptomyces*. *Appl. Environ. Microbiol.* **62**:3489-3493.
97. **Lohrke, S. M., J. H. Orf, and M. J. Sadowsky.** 1996. Inheritance of host-controlled restriction of nodulation by *Bradyrhizobium japonicum* strain USDA 110. *Crop Sci.* **36**:1271-1276.
98. **de Souza, M. L., L. P. Wackett, K. L. Boundy-Mills, R. T. Mandelbaum, and M. J. Sadowsky.** 1995. Cloning, characterization, and expression of a gene region from *Pseudomonas* sp. strain ADP involved in the dechlorination of atrazine. *Appl. Environ. Microbiol.* **61**: 3373-3378.
99. **Sadowsky, M. J., R. M. Kossak, B. Golinska, C. J. Madrzak, and P. B. Cregan.** 1995. Restriction of nodulation by *B. japonicum* is mediated by factors present in the roots of *Glycine max*. *Appl. Environ. Microbiol.* **61**:832-836.
100. **Madrzak, C. J., B. Golinska, J. Króliczak, K. Pudeko, D. Aewska, B. Lampka, and M. J. Sadowsky.** 1995. Diversity among field populations of *Bradyrhizobium japonicum* in Poland. *Appl. Environ. Microbiol* **61**:1194-1200.
101. **Lohrke, S. M., J. H. Orf, E. Martínez-Romero, and M. J. Sadowsky.** 1995. Host-controlled restriction of nodulation by *Bradyrhizobium japonicum* strains in serogroup 110. *Appl. Environ. Microbiol.* **61**:2378-2383.
102. **Graham, P. H., M. J. Sadowsky, S. W. Tighe, J. A. Thompson, R. A. Date, J. G. Howieson, and R. Thomas.** 1995. Differences among strains of *Bradyrhizobium* in fatty acid-methyl ester (FAME) analysis. *Can. J. Microbiol.* **41**:1038-1042.
103. **Noyd, R. K., F. L. Pfleger, R. E. Norland, and M. J. Sadowsky.** 1995. Native prairie grasses and microbial community responses to reclamation of taconite iron ore tailing. *Can. J. Botany.* **73**:1645-1654.

104. **Boldt, Y. R., M. J. Sadowsky, L. B. Ellis, L. Que, Jr., and L. P. Wackett.** 1994. A manganese-dependent dioxygenase from *Arthrobacter globiformis* strain CM-2 belongs to the major extradiol dioxygenase family. *J. Bacteriol.* **177**:1225-1232.
105. **Wackett, L. P., M. J. Sadowsky, L. M. Newman, H. Hur, and S. Li.** 1994. Metabolism of polyhalogenated compounds by a genetically engineered bacterium. *Nature* **368**:627-629.
106. **Hur, H., M. J. Sadowsky, and L. P. Wackett.** 1994. Metabolism of chlorofluorcarbons and polybrominated compounds by *P. putida* G786(pHG2) via an engineered metabolic pathway. *Appl. Environ. Microbiol.* **60**:4148-4154.
107. **Boundy-Mills, K. L., R. M. Kossak, R. E. Tully, S. G. Pueppke, S. Lohrke, and M. J. Sadowsky.** 1994. Induction of the *Rhizobium fredii* nod box-independent nodulation gene *nolJ* requires a functional *nodD1* gene. *Molec. Plant Microbe Interact.* **7**:305-308.
108. **Tong, Z, and M. J. Sadowsky.** 1994. A selective medium for the isolation and quantification of *Bradyrhizobium japonicum* and *Bradyrhizobium elkanii* strains from soils and inoculants. *Appl. Environ. Microbiol.* **60**:579-584.
109. **Kinkle, B. K., M. J. Sadowsky, K. Johnstone, and W. C. Koskinen.** 1994. Tellurium and selenium resistance in rhizobia with potential use for the direct isolation of *Rhizobium meliloti* from soil. *Appl. Environ. Microbiol.* **60**:1674-1677.
110. **Judd, A. K., M. J. Sadowsky, A. Bhagwat, P. B. Cregan, and R.-L. Liu.** 1993. Isolation of a *Bradyrhizobium japonicum* serogroup 123 mutant which has an extended host range for nodulation-restricting soybean genotypes. *FEMS Microbiol. Letters* **106**:205-210.
111. **Glew, J. G., J. S. Angle, and M. J. Sadowsky.** 1993. In vivo transfer of plasmid pR68.45 from *Pseudomonas aeruginosa* into the indigenous microbial population in non-sterile soil. *Microbial Releases*. **1**:237-241.
112. **Kinkle, B. K., M. J. Sadowsky, E. L. Schmidt, and W. C. Koskinen.** 1993. Transfer of the IncP plasmids pJP4 and r68.45 between bradyrhizobia populations in soil. *Appl. Environ. Microbiol.* **59**:1762-1766.
113. **Judd, A. K., M. Schneider, M. J. Sadowsky and F. J. de Bruijn.** 1993. The use of repetitive sequences and the polymerase chain reaction technique to classify genetically related *Bradyrhizobium japonicum* serocluster 123 strains. *Appl. Environ. Microbiol.* **59**:1702-1708.

114. **Judd, A. K., and M. J. Sadowsky.** 1993. The *Bradyrhizobium japonicum* serocluster 123 hyperreiterated DNA region, HRS1, shares DNA sequence and protein homology to IS1380, an insertion sequence from *Acetobacter pasteurianus*. *Appl. Environ. Microbiol.* **59**:1656-1661.
115. **Rodriguez-Quiñones, F., A. K. Judd, M. J. Sadowsky, R.-L. Liu, and P. B. Cregan.** 1992. Hyper-reiterated DNA regions are conserved among *Bradyrhizobium japonicum* serocluster 123 strains. *Appl. Environ. Microbiol.* **58**:1878-1885.
116. **Sadowsky, M. J., and P. B. Cregan.** 1992. The soybean Rj₄ allele restricts nodulation by *Bradyrhizobium japonicum* serogroup 123 strains. *Appl. Environ. Microbiol.* **58**:720-723.
117. **Triplett, E. W. and M. J. Sadowksy.** 1992. Genetics of Competition for Nodulation. *Ann. Rev. Microbiol.* **46**:399-428.
118. **Abebe, H. M., M. J. Sadowsky, B. K. Kinkle, and E. L. Schmidt.** 1992. Lysogeny in *Bradyrhizobium japonicum* and its affect on soybean nodulation. *Appl. Environ. Microbiol.* **58**:3360-3366.
119. **Sadowsky, M. J., P. B. Cregan, M. Gottfert, A. Sharma, D. Gerhold, F. Rodriguez - Quninones, H. H. Keyser, H. H. Hennecke, and G. Stacey.** 1991. The *Bradyrhizobium japonicum nolA* gene and its involvement in the genotype-specific nodulation of soybeans. *Proc. Nat. Acad. Sci. (USA)*. **88**:637-641.
120. **Tully, R., M. J. Sadowsky, and D. E. Keister.** 1991. Characterization of cytochromes C₅₅₀ and C₅₅₅ from *Bradyrhizobium japonicum*: Cloning and mutagenesis of the C₅₅₅ gene. *J. Bacteriol.* **173**:7887-7895.
121. **Graham, P. H., M. J. Sadowsky, H. H. Keyser, Y. M. Barnet, R. S. Bradley, J. E. Cooper, D. J. De Ley, B. W. Jarvis, E. B. Roslycky, B. W. Strijdom and J. P. W. Young.** 1991. Proposed minimal standards for the description of new genera and species of root- and stem-nodulating bacteria. *Int. J. Syst. Bacteriol.* **41**:582-587.
122. **Sadowsky, M. J., P. B. Cregan, and H. H. Keyser.** 1990. A DNA hybridization probe for use in determining restricted nodulation among *Bradyrhizobium japonicum* serocluster 123 field isolates. *Appl. Environ. Microbiol.* **56**:1468-1474.
123. **Sadowsky, M. J., P. B. Cregan, F. Rodriguez-Quinones, and H. H. Keyser.** 1990. Microbial influence on gene-for-gene interactions in legume-*Rhizobium* symbioses. *Plant and Soil* **129**:53-60.

124. **Sobral, B. W., M. J. Sadowsky, and A. G. Atherly.** 1990. Genome analysis of *Bradyrhizobium japonicum* serocluster 123 field isolates by using field gel inversion electrophoresis (FIGE). *Appl. Environ. Microbiol.* **56**:1949-1953.
125. **Cregan, P. B., H. H. Keyser, and M. J. Sadowsky.** 1989 Host plant effects on nodulation and competitiveness of the *Bradyrhizobium japonicum* serotype strains constituting serocluster 123. *Appl. Environ. Microbiol.* **55**:2532-2536.
126. **Cregan, P. B., H. H Keyser, and M. J. Sadowsky.** 1989. A soybean genotype that restricts nodulation of a previously unrestricted isolate of *Bradyrhizobium japonicum* serocluster 123. *Crop Science* **29**:307-312.
127. **Nautiyal, C. S., P. van Berkum, M. J. Sadowsky, and D. L. Keister.** 1989. Cytochrome mutants of *Bradyrhizobium* induced by transposon *Tn5*. *Plant Physiol.* **90**:553-559.
128. **Richaume, A., J. S. Angle, and M. J. Sadowsky.** 1989. Influence of soil variables on in situ plasmid transfer from *Escherichia coli* to *Rhizobium fredii*. *Appl. Environ. Microbiol.* **55**:1730-1734.
129. **Sadowsky, M. J., E. R. Olson, V. E. Foster, R. M. Kossak, and D.P.S. Verma.** 1988. Two host-inducible genes of *Rhizobium fredii* and the characterization of the inducing compound. *J. Bacteriol.* **170**:171-178.
130. **Sadowsky, M. J., P. B. Cregan, and H. H. Keyser.** 1988. Nodulation and nitrogen fixation efficacy of *Rhizobium fredii* with *Phaseolus vulgaris* genotypes. *Appl. Environ. Microbiol.* **54**:1907-1910.
131. **Sadowsky, M. J., B. B. Bohlool, and H. H. Keyser.** 1987. Serological relatedness of *Rhizobium fredii* to other rhizobia and to the bradyrhizobia. *Appl. Environ. Microbiol.* **53**:1785-1789.
132. **Sadowsky, M. J., R. E. Tully, P. B. Cregan, and H. H. Keyser.** 1987. Genetic diversity in *Bradyrhizobium japonicum* serogroup 123 and its relation to genotype-specific nodulation of soybeans. *Appl. Environ. Microbiol.* **53**:2624-2630.
133. **Sadowsky, M. J., and B. B. Bohlool.** 1986. Growth of fast- and slow-growing rhizobia on ethanol. *Appl. Environ. Microbiol.* **52**:951-953.
134. **Ayanaba, A., R. A. Haugland, M. J. Sadowsky, R. G. Upchurch, K. D. Weiland, and R. M. Zablotowicz.** 1986. Rapid colored nodule assay for assessing root exudate-enhanced competitiveness of *Bradyrhizobium japonicum*. *Appl. Environ. Microbiol.* **52**:847-851.

135. **Sadowsky, M. J., K. Rostas, P. R. Sista, H. Bussey, and D.P.S. Verma.** 1986. Symbiotically defective histidine auxotrophs of *Bradyrhizobium japonicum*. Arch. Microbiol. **144**:334-339.
136. **Olson, E. R., M. J. Sadowsky, and D.P.S. Verma.** 1985. Identification of genes involved in the *Rhizobium*-legume symbiosis by *mu-dI* (*Kan, lac*)-generated transcription fusions. Biotechnology **3**:143-149.
137. **Sadowsky, M. J., and B. B. Bohlool.** 1985. Differential expression of the pea symbiotic plasmid pJB5JI in genetically dissimilar backgrounds. Symbiosis **1**:125-138.
138. **Sadowsky, M. J., and B. B. Bohlool.** 1983. Possible involvement of a megaplasmid in nodulation of soybeans by fast-growing rhizobia from China. Appl. Environ. Microbiol. **46**:906-911.
139. **Sadowsky, M. J., H. H. Keyser, and B. B. Bohlool.** 1983. Biochemical characterization of fast- and slow-growing rhizobia that nodulate soybeans. Int. J. Syst. Bacteriol. **33**:716-722.
140. **Kossak, R. M., B. B. Bohlool, S. F. Dowdle, and M. J. Sadowsky.** 1983. Competition of *Rhizobium japonicum* strains in early stages of soybean nodulation. Appl. Environ. Microbiol. **46**:870-873.

Books Edited:

Santo Domingo, J. W., and M. J. Sadowsky. 2007. Microbial Source Tracking. ASM Press, Washington, DC.

Graham, P. H., M. J. Sadowsky, and C. P. Vance. 1994. Symbiotic Nitrogen Fixation. Kluwer Academic Publishers, Dordrecht.

Invited Book chapters and non-refereed articles:

Sadowsky, M. J. 2008. Diversity and Evolution of Microorganisms and Pathways for the Degradation of Environmental Contaminants: a Case Study with the s-triazine herbicides. In: BES Ecological Reviews -Ecology of Industrial Pollution: remediation, restoration and preservation. British Ecological Society, UK. In Press.

Sadowsky, M. J., D. R. Call, and J. W. Santo Domingo. 2006. The future of Microbial Source Tracking Studies. In: J. W. Santo Domongo and M. J. Sadowsky (Eds.). Microbial

Source Tracking: emerging issues in food safety, pp. 235-277. American Society for Microbiology, Washington, D.C.

LaPara, T.M., S. J Firl, L. J. Onan, S. Ghosh, T. Yan, and M. J. Sadowsky. 2006. Municipal wastewater treatment: A novel opportunity to slow the proliferation of antibiotic-resistant bacteria? CURA Reporter 36:18-23.

Hartwig, U. A. and M. J. Sadowsky. 2006. Biological nitrogen fixation: a key process for the response of grassland ecosystems to elevated atmospheric CO₂. In: J. Nösberger, S. P. Long, R. J. Norby, M. Stitt, G. R. Hendrey, and H. Blum, H. (Eds.). Managed Ecosystems and CO₂. Case Studies, Processes, and Perspectives, Ecological Studies, Vol. 187. Springer, New York, NY.

Mandelbaum, R. T., M. J. Sadowsky, and L. P. Wackett. 2006. Microbial degradation of s-triazine herbicides. In: H. LeBaron, J. McFarland, and O. Burnside (eds.), The Triazine Herbicides, Elsevier, Amsterdam. In Press

Sadowsky, M. J. 2005. Soil stress factors influencing symbiotic nitrogen fixation, pp. 89-112. In: D. Werner and W. E. Newton (eds.), Nitrogen Fixation Research in Agriculture, Forestry, Ecology, and the Environment. Kluwer, Amsterdam.

Sadowsky, M. J. 2002. The use of plants to degrade harmful chemicals in the environment. In: A. Shinmyo and K. Yoshida (eds.), Handbook of Plant Metabolic Engineering, NTS, Tokyo, pp. 707-713.

Sadowsky, M.J. and L. P. Wackett 2001. Genetics of atrazine degradation by *Pseudomonas* sp. strain ADP and other bacteria. In: R.E. Haugland, R.M.Zablotowicz, and J. C. Hall (eds.), Pesticide Biotransformations in Plants and Microorganisms, p. 268-282, American Chemical Society, Washington, DC.

Sadowsky, M.J. and P.H. Graham. 2000. Root and Stem Nodule Bacteria of Legumes. In: The Prokaryotes. M. Dworkin et al. (eds.). Springer-Verlag New York, Inc.

Sadowsky, M.J., and L. P. Wackett. 2000. Genetics of atrazine and s-triazine degradation by pseudomonas sp. strain ADP and other bacteria. In: Hall JC, Hoagland RE, Zablotowicz RM (eds. Pesticide biotransformations in plants and microorganisms, ACS Symp. Ser. 777. Oxford University Press, pp268-282.

Sadowsky, M. J., and R. F. Turco. 1999. Enhancing indigenous microorganisms to bioremediate contaminated soils, pp. 273-288. In: D. C. Adriano et al. (eds), Bioremediation of Contaminated Soils, Monograph no. 37. Amer. Soc. Agron., Crop Sci. Soc. Amer., and Soil Sci. Soc. Amer., Madison, WI.

Sadowsky, M. J. 1999. Competition for nodulation in the Soybean/*Bradyrhizobium japonicum* symbiosis. In: E. Triplett (ed.), Prokaryotic Nitrogen Fixation: A Model System for the Analysis of a Biological Process. Horizon Scientific, pp. 279-293..

Sadowsky, M. J., and H.-G. Hur. 1998. Use of endogenous repeated sequences to fingerprint bacterial genomic DNA. In: J.R. Lupski, G. Weinstock, and F. J. de Bruijn (eds.). Bacterial Genomes: Structure and Analysis. Chapman and Hall.

Sadowsky, M. J., L. P. Wackett, M. L. de Souza, K. L. Boundy-Mills, and R. T. Mandelbaum. 1998. Genetics of Atrazine Degradation in *Pseudomonas* sp. Strain ADP, pp. 88-94. In: Triazine Herbicides: Risk Assessment, L. Ballantine, J. McFarland, and D. Hackett (eds.), American Chemical Society, Washington, D.C.

Wackett, L. P., M. J. Sadowsky, M. L. de Souza, and R. T. Mandelbaum. 1998. Atrazine hydrolysis by a bacterial enzyme, pp. 82-87. In: Triazine Herbicides: Risk Assessment, L. Ballantine, J. McFarland, and D. Hackett (eds.), American Chemical Society, Washington, D.C.

Sadowsky, M. J., and P. H. Graham. 1997. Soil Biology of the *Rhizobiaceae*. In: The *Rhizobiaceae*, pp. 155-172.. H. P. Spaink, A. Kondorosi, and P. J. J. Hooykaas (eds.), Kluwer, The Netherlands.

Sadowsky, M. J., and R. F. Turco. 1997. Enhancing indigenous microorganisms to bioremediate contaminated soils. In: J.-M. Bollag, W. Frankenberger, and R. Sims (eds.). Bioremediation of Contaminated Soils. Agronomy Society of America, Madison, Wisconsin.

Turco, R. F.. and M. J. Sadowsky. 1995. Understanding the microflora of bioremediation. In: Bioremediation: Science and Applications, Soil Science Special Publication No. 43, Soil Science Society of America, Madison, Wisconsin.

Sadowsky, M. J. 1994. Microbial DNA fingerprinting and restriction fragment length polymorphism analysis. In: Methods of Soil Analysis, Chemical and Microbiological Properties of Soils, pp. 647-664. R. W. Weaver, J. S. Angle, and P. Bottomley (eds.). ASA-SSSA, Madison.

McCardell, A., P. B. Cregan, and M. J. Sadowsky. 1992. Genetics and improvement of biological nitrogen fixation, pp. 151-175. In: Soil Microbial Ecology, B. Metting (Ed.). Marcel Dekker, Inc., New York.

Cregan, P. B., M. J. Sadowsky, and H. H. Keyser. 1991. Gene-for-gene interaction in the legume-*Rhizobium* symbiosis. pp. 167-173. In: D.L. Keister and P.B. Cregan (eds.). The Rhizosphere and Plant Growth, Kluwer Academic Publications, The Netherlands.

Sadowsky, M. J., P. B. Cregan, F. Rodriguez-Quinones, and H. H. Keyser. 1991. Microbial

influence on gene-for-gene interactions in legume-*Rhizobium* symbioses. pp. 173-180. In: D.L. Keister and P.B. Cregan (eds.). The Rhizosphere and Plant Growth, Kluwer Academic Publications, The Netherlands.

Keyser, H. H., M. J. Sadowsky, and B. B. Bohlool. 1984. Fast-growing Soybean Rhizobia, pp. 926-934. In: R. Schibler (ed.). World Soybean Research Conference-III: Proceedings. Westview Press, Boulder, Colorado.

Invited Presentations:

Sadowsky, M. J. 2008. Sources and Sinks of *E. coli* in the Environment: High Selection Pressure Leads to Extreme Adaptations. Marshfield Clinic, Marshfield, WI.

Sadowsky, M. J. 2008. Diversity and evolution of microorganisms, genes, and catabolic pathways for the biodegradation of s-triazine herbicides and structurally related compounds. Tohoku University, Sendai, Japan.

Sadowsky, M. J. 2008. Rapid Evolution of Bacterial Genes and Pathways for Biodegradation of Synthetic Organic Compounds. University of Tokyo, Tokyo, Japan.

Sadowsky, M. J. 2008. Structural and Functional Genomics of Bradyrhizobium – A Nitrogen Fixing symbiont of Legumes. Korean Society for Applied Biological Chemistry, Daegu, Korea.

Sadowsky, M. J. 2008. Diversity and evolution of microorganisms, genes, and catabolic pathways for the biodegradation of s-triazine herbicides and structurally related compounds. Osaka University, San Francisco Campus. San Francisco, CA

Sadowsky, M. J. 2008. Rapid Evolution of Bacterial Genes and Pathways for Biodegradation of Synthetic Organic Compounds: Genomic Insights for the Degradation and Bioremediation of s-Triazine Herbicides. Texas A&M University, College Station, TX.

Sadowsky, M. J. 2008. Association of Human Bacterial Pathogens with the Green Alga Cladophora in Nearshore Water of Lake Michigan Great Lakes Beach Association Annual Meeting. Porter, IN.

Sadowsky, M. J. 2008. Rapid Evolution of Bacterial Genes and Pathways for Biodegradation of Synthetic Organic Compounds. British Ecological Society Annual Meeting, Birmingham, England.

Sadowsky, M. J. 2007. Biodegradation of Atrazine and Related s-Triazine Herbicides by Soil Bacteria: A Tale of Two Organisms. Georgia Institute of Technology, Atlanta, GA

Sadowsky, M. J. 2007. A New Paradigm for Symbioses Between Legumes and Bradyrhizobia: We're Not Done Learning Yet! North Carolina State University, Raleigh, NC

Sadowsky, M. J. 2007. Development and Use of Marker Genes to Determine Sources and Sinks of Fecal Bacteria and Pathogens in the Environment. University of Montana Missoula, MT

Sadowsky, M. J. 2007. New Paradigms in Symbiotic Interactions of Legumes with Microbes: We are not done learning yet! Hamline University, St. Paul, MN

Sadowsky, M. J. 2007. New Surprises Learned from Photosynthetic, Symbiotic, Nitrogen-Fixing Bacteria: Can we Lessen the Environmental Load of Nitrogen Fertilizers Even More. IERC Workshop, Gwangju, Korea.

Sadowsky, M. J. 2007. Structural Genomics of Photosynthetic, Nitrogen-Fixing, Bradyrhizobium and Functional Genomics of *Bradyrhizobium japonicum*. Osaka University, San Francisco, CA

Sadowsky, M. J. 2007. A New Paradigm for the Nodulation of Legumes by *Bradyrhizobium*. Plant Biological Sciences Colloquium, St. Paul, MN

Sadowsky, M. J. 2007. Library-Dependent Genotypic Methods for MST Studies. EpiNet, Chicago, IL.

Sadowsky, M. J. 2007. Association of Human Bacterial Pathogens with the Green Alga Cladophora in Nearshore Water of Lake Michigan. Great Lakes Beach Association Meeting, Traverse City, MI.

Sadowsky, M. J. 2006. Has Human Activity Outstripped the Environment's Ability to Rid Itself of Fecal Bacteria?: Lessons Learned from the Coliforms". Earthday Lecture, University of Missouri Columbia, Mo.

Sadowsky, M. J. 2005. Genetic Diversity of *E. coli* Impacts Determination of Sources and Sinks of Fecal Bacteria in the Environment. EEB Department Seminar. University of Minnesota

Sadowsky, M. J. 2005. The Myths and Reality about DNA Fingerprint Databases for Determination of Sources of Fecal Contamination in Water, Beach Contamination Source Identification Techniques Workshop, Door County, WI

Sadowsky, M. J. 2005. The use of Genomic Technologies to Determine Sources and Sinks of Fecal Bacteria in the Environment: Issues of Diversity and Scale. Henrici Society Annual Meeting.

Sadowsky, M.J. 2005. The Genomics and Genetics of Atrazine Biodegradation Among Gram Negative and Gram Positive Soil Bacteria. Kwangju Institute of Science and Technology, Korea.

Sadowsky, M.J. 2005. Development and use of new methods to determine sources of fecal bacteria in waterways. IWA conference on Water Reclamation and Reuse for Sustainability, Jeju, Korea.

Sadowsky, M. J. 2004. The Use of DNA Fingerprinting Technologies to Determine Sources and Sinks of Bacteria in the Environment. NAIST Seminar, Nara. Japan.

Sadowsky, M. J. 2004. Genetics and Genomics of the Biodegradation of Atrazine and Related s-Triazine Herbicides by Bacteria: from the Field to Lab and Back Again. IERC Workshop, Gwangju, Korea.

Sadowsky, M. J. 2004. Ecology and Genetics of Rhizobia Influencing Nodulation Competitiveness. Korean Microbiological Society, Seoul, Korea.

Sadowsky, M.J. 2004. Genetics and Genomics of the Biodegradation of Atrazine and Related s-Triazine Herbicides by Bacteria, Korean Society for Applied Biological Chemistry, Inchon, Korea.

Sadowsky, M.J. 2004. The Use of DNA Fingerprint Libraries to Determine Sources of Fecal Pollution in Waterways: How large do they need to be? MN Waters Conference, Minneapolis.

Sadowsky, M.J. 2004. Biochemistry and Genomics of s-Triazine Degradation in Bacteria: from Genes to Plants and Beyond. University of Missouri, Columbia.

Sadowsky, M. J. 2003. Environmental and Industrial Applications of Legumes and Rhizobia: Does the Symbiosis Help? International Symbiosis Society Congress, Halifax, Nova Scotia.

Sadowsky, M. J. 2003. The Rise and Spread of Catabolic Genes for the Degradation of s-Triazines. 153rd Society for General Microbiology Annual Meeting, Manchester, England.

Sadowsky, M. J. 2002. The Biodegradation of Atrazine. Montana State University, Department of Land Resources and Environmental Sciences, Bozeman, Montana.

Sadowsky, M. J. 2002. Development and Application of Methods to Identify Sources of Fecal Pollution in Water. American Society for Microbiology General Meeting.

Sadowsky, M. J. 2002. Methods to Identify Sources of Fecal Pollution in Water. Minnesota Department of Agriculture.

Sadowsky, M. J. 2002. The Use of Molecular Methods to Track Sources and Sinks of Microorganisms in the Environment, Kwangju Institute of Science and Technology, Department of Environmental Science and Engineering, Korea.

Sadowsky, M. J. 2002. Seoul National University, Department of Microbiology, Korea

Sadowsky, M. J. 2002. Yeonsei University, Korea.

Sadowsky, M. J. 2002. Inactivation of *Sinorhizobium fredii* noeF Results in Mutants Defective in Competition for Nodulation of Soybean. 18th North American Symbiotic Nitrogen Fixation Conference, Columbia, Missouri.

Sadowsky, M. J. 2001. Plant and Microbial Control of Restriction of Nodulation in the *B. japonicum*/soybean Symbiosis. Department of Agriculture, Bangkok, Thailand.

Sadowsky, M. J. and L.P. Wackett. 2001. The Biodegradation of Atrazine: Lessons to be learned from Genetic and Genomic Approaches. American Society for Microbiology-B3 Symposium, Puerto Rico.

Sadowsky, M. J. 2001. Biodegradation of AtrazineThe Power of Genomics Revealed!! American Society for Microbiology - North Central Branch Meeting, Eau Claire, Wisconsin.

Sadowsky, M. J. 2001. Influence of Elevated Atmospheric CO₂ on Soil Microbial Diversity: A Matter of Scale. Nalbandov Conference, University of Illinois.

Sadowsky, M.J. and L. P. Wackett. 2001. Biodegradation of Atrazine and Related *s*-Triazine Herbicides by Soil Bacteria, NSF Workshop on Microbial Ecology, Cairo, Egypt.

Sadowsky, M. J. 2001. Emerging Environmental and Industrial Application of Legumes and Rhizobia. 13th Nitrogen Fixation Congress, Hamilton, Ontario, Canada.

Sadowsky, M. J. 2001. A Large Scale rep-PCR Database to Determine Sources of Fecal Bacteria: How Large Should it Be? American Society for Microbiology Annual Meeting, Orlando, Fla.

Johnson, L., P. Dombek, and M. J. Sadowsky. 2000. A DNA Fingerprinting Method to Track Sources of Fecal Pollution. ASA Symposium. Minneapolis, MN

Sadowsky, M. J. 2000. The Genetics and Biochemistry of Atrazine Biodegradation by Gram Negative Bacteria . BMBB Department Seminar, MPLS Campus

Sadowsky, M. J. 2000. The biodegradation of atrazine: from field to the lab and back again. The Otto Warburg Center for Agricultural Biotechnology, Rehovot, Israel

Sadowsky, M. J. 2000. The influence of inoculum dosage and other physiological factors on host-controlled restriction of nodulation in the *Bradyrhizobium japonicum*/soybean symbiosis. JSPS-MPMI. Sendai, Japan.

Sadowsky, M. J. 2000 Atrazine biodegradation: biochemistry, genetics and ecology. Tohoku University, Sendai, Japan.

Sadowsky, M. J. 2000. DNA Fingerprinting Methodology to Track Sources of Fecal Pollutants in Water. Texas A&M University, Poultry Science Dept., College Station, TX

Sadowsky, M. J. 2000. Phylogeny, Characteristics and Genetics of *Bradyrhizobium japonicum*: the agriculturally important symbiont of soybeans. Integrated Genomics, Chicago, IL.

Sadowsky, M. J. 2000. Genetics and Biochemistry of Herbicide Degradation by *Pseudomonas* sp. Strain ADP. NAIST Sympsum, NARA, JAPAN

Sadowsky, M. J. 2000. Novel environmental and industrial application of legumes and symbiotic nitrogen-fixing organisms. NASNFC, Quebec City, Canada

Sadowsky, M. J. 2000. The Biodegradation of Atrazine by BacteriaFrom Field to Lab and Back Again. Microbiology Department, University of Tennessee. Knoxville, TN.

Sadowsky, M. J. 2000. Microbial Degradation of Pesticides. Agricultural Microbes Genomes 1 Conference. San Diego, CA.

Sadowsky, M. J. 2000. The *Bradyrhizobium japonicum* sequencing project: Lessons to be learned from an Agriculturally Important Symbiont. Genomics and Bioinformatics in Plant Pathology Symposium, St. Paul, MN

Sadowsky, M. J. 2000. Biodegradation of Atrazine. Tianjin Agricultural College, Tianjin, China.

Smith, D. R., K. Boundy-Mills, and M. J. Sadowsky. 1998. The *Rhizobium fredii noeF* gene is involved in competition for nodulation of soybean and affects nodule initiation. 16th North American Symbiotic Nitrogen Fixation Conference. Cacun, Mexico.

Sadowsky, M. J. 1998. Bioremediation: Past Promises and Future Strategies. Eighth International Symposium for Microbial Ecology, Halifax, Nova Scotia

Sadowsky, M. J. 1998. Host and Microbial Specificity in the *B. japonicum*/Soybean Symbiosis. Department of Biochemistry, University of Wisconsin- Madison

Sadowsky, M. J. 1998. Ecology and Competitiveness of Rhizobia in Soils. 19th Latin American *Rhizobium* Conference, Maturin, Venezuela

Sadowsky, M. J. 1997. Bioremediation: Past Promises and Future Strategies. Michigan State University, East Lansing, MI.

Sadowsky, M. J. 1977. Atrazine Degradation and Bioremediation by Soil Bacteria. U. S. Army Military Academy, West Point, N.Y.

Sadowsky, M. J. 1997. Genetics, Biochemistry, and Evolution of Atrazine Degradation by Soil Bacteria. Ohi() State University, Columbus, Ohio.

Sadowsky, M. J., Lohrke, S. M., and J. Orf. 1996. Host-controlled restriction of nodulation by *Bradyrhizobium japonicum* strain USDA 110 and characterization of the genes regulating nodulation. 2nd European Nitrogen Fixation Conference and NATO Advanced Research Workshop. Poznan, Poland.

Sadowsky, M. J. 1996. Influence of elevated pCO₂ on the activity and community structure of microorganisms in the rhizosphere of clover and ryegrass. ETH, Zurich, Switzerland.

Sadowsky, M. J., Schortemeyer, M., and U. A. Hartwig. 1996. Microbial populations in the rhizosphere may be altered under elevated CO₂. GCTE and COST 619 Workshop. Davos, Switzerland.

Sadowsky, M. J. 1996. Use of bioremediation strategies to bioremediate contaminated soils. 8th International Congress, Molecular Plant-Microbe Interactions, Knoxville, TN.

Sadowsky, M. J., and L. P. Wackett. 1996. Genetics of atrazine degradation by *Pseudomonas* sp. strain ADP. Annual meeting of the American Chemical Society, New Orleans, LO.

Sadowsky, M. J. 1995. The use of host-controlled nodulation restriction as a means to examine specificity in the soybean/*B. japonicum* symbiosis. 15th North American Symbiotic Nitrogen Fixation Conference. Raleigh, North Carolina.

Sadowsky, M. J and H. Moawad. 1995. The use of rep-PCR DNA fingerprinting to examine competition for nodulation among genetically-related *Bradyrhizobium japonicum*. 10th International Congress on Nitrogen Fixation. Saint Petersburg, Russia.

Sadowsky, M. J. 1995. Use of microorganism with constructed chemical pathways to degrade recalcitrant haloorganic compounds. Wastes Engineering Conference, St. Paul.

Sadowsky, M. J. 1994. Positive and negative control of nodulation genes in the *Bradyrhizobium japonicum*. University of Michigan.

Sadowsky, M. J. 1994. Control of nodulation genes in the *Bradyrhizobiumjaponicum/soybean* symbiosis. University of Cincinnati.

Sadowsky, M. J. 1993. Positive and negative control nodulation in the soybean/ *Bradyrhizobium japonicum* symbiosis affects competition for nodulation. Oregon State University.

Tufts, P. C., and M. J. Sadowsky. 1992. The use of random *Tn5 lac*-transcription fusion mutagenesis to analyze gene expression in *R. meliloti* grown under osmotic stress. 9th International Congress on Nitrogen Fixation. Cancun, Mexico.

Sadowsky, M. J. 1992. Competition and the establishment of introduced microorganisms in the rhizosphere. Ecological Interactions and Biological Control Conference. Minneapolis, Minnesota.

Sadowsky, M. J. 1991. Positive and negative control of soybean nodulation by *Bradyrhizobium japonicum*. International Symbiosis Congress, Jerusalem, Israel.

Sadowsky, M. J. 1991. Gene-for-Gene Interactions in legume symbioses. Midwest Biotechnology Symposium. Madison, Wisconsin.

Sadowsky, M. J. 1991. Use of gene fusion techniques to examine the influence of environmental variables on the growth and survival of microorganisms. Spring Environmental Sciences Review, Gray Freshwater Biology Institute, Navarre, MN.

Sadowsky, M. J., R. Tully, and R. M. Kossak. 1990. Identification of a nod box-independent, root exudate-inducible nodulation gene from *Sinorhizobiumj豇豆ii*. Vector Young Investigator Award Seminar. American Society for Microbiology Annual Meeting, Anaheim, CA.

Sadowsky, M. J. 1990. Biology of *Rhizobium-Plant* Interactions. Summer Symposium, Gray Freshwater Biology Institute, Navarre, MN. Invited.

Sadowsky, M. J. 1990. Methods to assess DNA movement among soil microorganisms. In: Symposium-Molecular Ecology of Microorganisms in Soil, 8rd Annual Meeting of ASA, CSSA, and SSSA, San Antonio, Texas.

Sadowsky, M. J. 1991. Gene probe techniques for soil microbiology. Abstracts of the 83rd Annual Meeting of ASA, CSSA, and SSSA. Denver, Colorado.

Angle, J.S., J. G. Glew, and M. J. Sadowsky. 1990. Mechanisms and potential for exchange of plasmid DNA. In: Symposium-Molecular Ecology of Microorganisms in Soil, 8rd Annual Meeting of ASA, CSSA, and SSSA, San Antonio, Texas.

Sadowsky, M. J., P. B. Cregan, F. Rodriguez-Quinones, and H. H. Keyser. 1989. Microbial influence on gene-for-gene interactions in legume-Rhizobium symbioses. Beltsville Symposium XIV, Beltsville, Maryland.